

The
Condensed Chemical
Dictionary

SEVENTH EDITION

Completely revised and enlarged by
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State College, Pa.

VAN NOSTRAND REINHOLD COMPANY
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END PAPER (FRONT): Styrene Plant of Monsanto Corp., Texas City
END PAPER (REAR): Catalytic Reforming Unit of Gulf Oil Co., Port Arthur, Tex.

"Musk Tibetene." ²²¹ Trademark for 2,6-dinitro-3,4,5-trimethyl-tert-butylbenzene.

musl. ²²² (musl. ²²³ ²²⁴ ²²⁵ ²²⁶ ²²⁷ ²²⁸ ²²⁹ ²³⁰ ²³¹ ²³² ²³³ ²³⁴ ²³⁵ ²³⁶ ²³⁷ ²³⁸ ²³⁹ ²⁴⁰ ²⁴¹ ²⁴² ²⁴³ ²⁴⁴ ²⁴⁵ ²⁴⁶ ²⁴⁷ ²⁴⁸ ²⁴⁹ ²⁵⁰ ²⁵¹ ²⁵² ²⁵³ ²⁵⁴ ²⁵⁵ ²⁵⁶ ²⁵⁷ ²⁵⁸ ²⁵⁹ ²⁶⁰ ²⁶¹ ²⁶² ²⁶³ ²⁶⁴ ²⁶⁵ ²⁶⁶ ²⁶⁷ ²⁶⁸ ²⁶⁹ ²⁷⁰ ²⁷¹ ²⁷² ²⁷³ ²⁷⁴ ²⁷⁵ ²⁷⁶ ²⁷⁷ ²⁷⁸ ²⁷⁹ ²⁸⁰ ²⁸¹ ²⁸² ²⁸³ ²⁸⁴ ²⁸⁵ ²⁸⁶ ²⁸⁷ ²⁸⁸ ²⁸⁹ ²⁹⁰ ²⁹¹ ²⁹² ²⁹³ ²⁹⁴ ²⁹⁵ ²⁹⁶ ²⁹⁷ ²⁹⁸ ²⁹⁹ ³⁰⁰ ³⁰¹ ³⁰² ³⁰³ ³⁰⁴ ³⁰⁵ ³⁰⁶ ³⁰⁷ ³⁰⁸ ³⁰⁹ ³¹⁰ ³¹¹ ³¹² ³¹³ ³¹⁴ ³¹⁵ ³¹⁶ ³¹⁷ ³¹⁸ ³¹⁹ ³²⁰ ³²¹ ³²² ³²³ ³²⁴ ³²⁵ ³²⁶ ³²⁷ ³²⁸ ³²⁹ ³³⁰ ³³¹ ³³² ³³³ ³³⁴ ³³⁵ ³³⁶ ³³⁷ ³³⁸ ³³⁹ ³⁴⁰ ³⁴¹ ³⁴² ³⁴³ ³⁴⁴ ³⁴⁵ ³⁴⁶ ³⁴⁷ ³⁴⁸ ³⁴⁹ ³⁵⁰ ³⁵¹ ³⁵² ³⁵³ ³⁵⁴ ³⁵⁵ ³⁵⁶ ³⁵⁷ ³⁵⁸ ³⁵⁹ ³⁶⁰ ³⁶¹ ³⁶² ³⁶³ ³⁶⁴ ³⁶⁵ ³⁶⁶ ³⁶⁷ ³⁶⁸ ³⁶⁹ ³⁷⁰ ³⁷¹ ³⁷² ³⁷³ ³⁷⁴ ³⁷⁵ ³⁷⁶ ³⁷⁷ ³⁷⁸ ³⁷⁹ ³⁸⁰ ³⁸¹ ³⁸² ³⁸³ ³⁸⁴ ³⁸⁵ ³⁸⁶ ³⁸⁷ ³⁸⁸ ³⁸⁹ ³⁹⁰ ³⁹¹ ³⁹² ³⁹³ ³⁹⁴ ³⁹⁵ ³⁹⁶ ³⁹⁷ ³⁹⁸ ³⁹⁹ ⁴⁰⁰ ⁴⁰¹ ⁴⁰² ⁴⁰³ ⁴⁰⁴ ⁴⁰⁵ ⁴⁰⁶ ⁴⁰⁷ ⁴⁰⁸ ⁴⁰⁹ ⁴¹⁰ ⁴¹¹ ⁴¹² ⁴¹³ ⁴¹⁴ ⁴¹⁵ ⁴¹⁶ ⁴¹⁷ ⁴¹⁸ ⁴¹⁹ ⁴²⁰ ⁴²¹ ⁴²² ⁴²³ ⁴²⁴ ⁴²⁵ ⁴²⁶ ⁴²⁷ ⁴²⁸ ⁴²⁹ ⁴³⁰ ⁴³¹ ⁴³² ⁴³³ ⁴³⁴ ⁴³⁵ ⁴³⁶ ⁴³⁷ ⁴³⁸ ⁴³⁹ ⁴⁴⁰ ⁴⁴¹ ⁴⁴² ⁴⁴³ ⁴⁴⁴ ⁴⁴⁵ ⁴⁴⁶ ⁴⁴⁷ ⁴⁴⁸ ⁴⁴⁹ ⁴⁵⁰ ⁴⁵¹ ⁴⁵² ⁴⁵³ ⁴⁵⁴ ⁴⁵⁵ ⁴⁵⁶ ⁴⁵⁷ ⁴⁵⁸ ⁴⁵⁹ ⁴⁶⁰ ⁴⁶¹ ⁴⁶² ⁴⁶³ ⁴⁶⁴ ⁴⁶⁵ ⁴⁶⁶ ⁴⁶⁷ ⁴⁶⁸ ⁴⁶⁹ ⁴⁷⁰ ⁴⁷¹ ⁴⁷² ⁴⁷³ ⁴⁷⁴ ⁴⁷⁵ ⁴⁷⁶ ⁴⁷⁷ ⁴⁷⁸ ⁴⁷⁹ ⁴⁸⁰ ⁴⁸¹ ⁴⁸² ⁴⁸³ ⁴⁸⁴ ⁴⁸⁵ ⁴⁸⁶ ⁴⁸⁷ ⁴⁸⁸ ⁴⁸⁹ ⁴⁹⁰ ⁴⁹¹ ⁴⁹² ⁴⁹³ ⁴⁹⁴ ⁴⁹⁵ ⁴⁹⁶ ⁴⁹⁷ ⁴⁹⁸ ⁴⁹⁹ ⁵⁰⁰ ⁵⁰¹ ⁵⁰² ⁵⁰³ ⁵⁰⁴ ⁵⁰⁵ ⁵⁰⁶ ⁵⁰⁷ ⁵⁰⁸ ⁵⁰⁹ ⁵¹⁰ ⁵¹¹ ⁵¹² ⁵¹³ ⁵¹⁴ ⁵¹⁵ ⁵¹⁶ ⁵¹⁷ ⁵¹⁸ ⁵¹⁹ ⁵²⁰ ⁵²¹ ⁵²² ⁵²³ ⁵²⁴ ⁵²⁵ ⁵²⁶ ⁵²⁷ ⁵²⁸ ⁵²⁹ ⁵³⁰ ⁵³¹ ⁵³² ⁵³³ ⁵³⁴ ⁵³⁵ ⁵³⁶ ⁵³⁷ ⁵³⁸ ⁵³⁹ ⁵⁴⁰ ⁵⁴¹ ⁵⁴² ⁵⁴³ ⁵⁴⁴ ⁵⁴⁵ ⁵⁴⁶ ⁵⁴⁷ ⁵⁴⁸ ⁵⁴⁹ ⁵⁵⁰ ⁵⁵¹ ⁵⁵² ⁵⁵³ ⁵⁵⁴ ⁵⁵⁵ ⁵⁵⁶ ⁵⁵⁷ ⁵⁵⁸ ⁵⁵⁹ ⁵⁶⁰ ⁵⁶¹ ⁵⁶² ⁵⁶³ ⁵⁶⁴ ⁵⁶⁵ ⁵⁶⁶ ⁵⁶⁷ ⁵⁶⁸ ⁵⁶⁹ ⁵⁷⁰ ⁵⁷¹ ⁵⁷² ⁵⁷³ ⁵⁷⁴ ⁵⁷⁵ ⁵⁷⁶ ⁵⁷⁷ ⁵⁷⁸ ⁵⁷⁹ ⁵⁸⁰ ⁵⁸¹ ⁵⁸² ⁵⁸³ ⁵⁸⁴ ⁵⁸⁵ ⁵⁸⁶ ⁵⁸⁷ ⁵⁸⁸ ⁵⁸⁹ ⁵⁹⁰ ⁵⁹¹ ⁵⁹² ⁵⁹³ ⁵⁹⁴ ⁵⁹⁵ ⁵⁹⁶ ⁵⁹⁷ ⁵⁹⁸ ⁵⁹⁹ ⁶⁰⁰ ⁶⁰¹ ⁶⁰² ⁶⁰³ ⁶⁰⁴ ⁶⁰⁵ ⁶⁰⁶ ⁶⁰⁷ ⁶⁰⁸ ⁶⁰⁹ ⁶¹⁰ ⁶¹¹ ⁶¹² ⁶¹³ ⁶¹⁴ ⁶¹⁵ ⁶¹⁶ ⁶¹⁷ ⁶¹⁸ ⁶¹⁹ ⁶²⁰ ⁶²¹ ⁶²² ⁶²³ ⁶²⁴ ⁶²⁵ ⁶²⁶ ⁶²⁷ ⁶²⁸ ⁶²⁹ ⁶³⁰ ⁶³¹ ⁶³² ⁶³³ ⁶³⁴ ⁶³⁵ ⁶³⁶ ⁶³⁷ ⁶³⁸ ⁶³⁹ ⁶⁴⁰ ⁶⁴¹ ⁶⁴² ⁶⁴³ ⁶⁴⁴ ⁶⁴⁵ ⁶⁴⁶ ⁶⁴⁷ ⁶⁴⁸ ⁶⁴⁹ ⁶⁵⁰ ⁶⁵¹ ⁶⁵² ⁶⁵³ ⁶⁵⁴ ⁶⁵⁵ ⁶⁵⁶ ⁶⁵⁷ ⁶⁵⁸ ⁶⁵⁹ ⁶⁶⁰ ⁶⁶¹ ⁶⁶² ⁶⁶³ ⁶⁶⁴ ⁶⁶⁵ ⁶⁶⁶ ⁶⁶⁷ ⁶⁶⁸ ⁶⁶⁹ ⁶⁷⁰ ⁶⁷¹ ⁶⁷² ⁶⁷³ ⁶⁷⁴ ⁶⁷⁵ ⁶⁷⁶ ⁶⁷⁷ ⁶⁷⁸ ⁶⁷⁹ ⁶⁸⁰ ⁶⁸¹ ⁶⁸² ⁶⁸³ ⁶⁸⁴ ⁶⁸⁵ ⁶⁸⁶ ⁶⁸⁷ ⁶⁸⁸ ⁶⁸⁹ ⁶⁹⁰ ⁶⁹¹ ⁶⁹² ⁶⁹³ ⁶⁹⁴ ⁶⁹⁵ ⁶⁹⁶ ⁶⁹⁷ ⁶⁹⁸ ⁶⁹⁹ ⁷⁰⁰ ⁷⁰¹ ⁷⁰² ⁷⁰³ ⁷⁰⁴ ⁷⁰⁵ ⁷⁰⁶ ⁷⁰⁷ ⁷⁰⁸ ⁷⁰⁹ ⁷¹⁰ ⁷¹¹ ⁷¹² ⁷¹³ ⁷¹⁴ ⁷¹⁵ ⁷¹⁶ ⁷¹⁷ ⁷¹⁸ ⁷¹⁹ ⁷²⁰ ⁷²¹ ⁷²² ⁷²³ ⁷²⁴ ⁷²⁵ ⁷²⁶ ⁷²⁷ ⁷²⁸ ⁷²⁹ ⁷³⁰ ⁷³¹ ⁷³² ⁷³³ ⁷³⁴ ⁷³⁵ ⁷³⁶ ⁷³⁷ ⁷³⁸ ⁷³⁹ ⁷⁴⁰ ⁷⁴¹ ⁷⁴² ⁷⁴³ ⁷⁴⁴ ⁷⁴⁵ ⁷⁴⁶ ⁷⁴⁷ ⁷⁴⁸ ⁷⁴⁹ ⁷⁵⁰ ⁷⁵¹ ⁷⁵² ⁷⁵³ ⁷⁵⁴ ⁷⁵⁵ ⁷⁵⁶ ⁷⁵⁷ ⁷⁵⁸ ⁷⁵⁹ ⁷⁶⁰ ⁷⁶¹ ⁷⁶² ⁷⁶³ ⁷⁶⁴ ⁷⁶⁵ ⁷⁶⁶ ⁷⁶⁷ ⁷⁶⁸ ⁷⁶⁹ ⁷⁷⁰ ⁷⁷¹ ⁷⁷² ⁷⁷³ ⁷⁷⁴ ⁷⁷⁵ ⁷⁷⁶ ⁷⁷⁷ ⁷⁷⁸ ⁷⁷⁹ ⁷⁸⁰ ⁷⁸¹ ⁷⁸² ⁷⁸³ ⁷⁸⁴ ⁷⁸⁵ ⁷⁸⁶ ⁷⁸⁷ ⁷⁸⁸ ⁷⁸⁹ ⁷⁹⁰ ⁷⁹¹ ⁷⁹² ⁷⁹³ ⁷⁹⁴ ⁷⁹⁵ ⁷⁹⁶ ⁷⁹⁷ ⁷⁹⁸ ⁷⁹⁹ ⁸⁰⁰ ⁸⁰¹ ⁸⁰² ⁸⁰³ ⁸⁰⁴ ⁸⁰⁵ ⁸⁰⁶ ⁸⁰⁷ ⁸⁰⁸ ⁸⁰⁹ ⁸¹⁰ ⁸¹¹ ⁸¹² ⁸¹³ ⁸¹⁴ ⁸¹⁵ ⁸¹⁶ ⁸¹⁷ ⁸¹⁸ ⁸¹⁹ ⁸²⁰ ⁸²¹ ⁸²² ⁸²³ ⁸²⁴ ⁸²⁵ ⁸²⁶ ⁸²⁷ ⁸²⁸ ⁸²⁹ ⁸³⁰ ⁸³¹ ⁸³² ⁸³³ ⁸³⁴ ⁸³⁵ ⁸³⁶ ⁸³⁷ ⁸³⁸ ⁸³⁹ ⁸⁴⁰ ⁸⁴¹ ⁸⁴² ⁸⁴³ ⁸⁴⁴ ⁸⁴⁵ ⁸⁴⁶ ⁸⁴⁷ ⁸⁴⁸ ⁸⁴⁹ ⁸⁵⁰ ⁸⁵¹ ⁸⁵² ⁸⁵³ ⁸⁵⁴ ⁸⁵⁵ ⁸⁵⁶ ⁸⁵⁷ ⁸⁵⁸ ⁸⁵⁹ ⁸⁶⁰ ⁸⁶¹ ⁸⁶² ⁸⁶³ ⁸⁶⁴ ⁸⁶⁵ ⁸⁶⁶ ⁸⁶⁷ ⁸⁶⁸ ⁸⁶⁹ ⁸⁷⁰ ⁸⁷¹ ⁸⁷² ⁸⁷³ ⁸⁷⁴ ⁸⁷⁵ ⁸⁷⁶ ⁸⁷⁷ ⁸⁷⁸ ⁸⁷⁹ ⁸⁸⁰ ⁸⁸¹ ⁸⁸² ⁸⁸³ ⁸⁸⁴ ⁸⁸⁵ ⁸⁸⁶ ⁸⁸⁷ ⁸⁸⁸ ⁸⁸⁹ ⁸⁹⁰ ⁸⁹¹ ⁸⁹² ⁸⁹³ ⁸⁹⁴ ⁸⁹⁵ ⁸⁹⁶ ⁸⁹⁷ ⁸⁹⁸ ⁸⁹⁹ ⁹⁰⁰ ⁹⁰¹ ⁹⁰² ⁹⁰³ ⁹⁰⁴ ⁹⁰⁵ ⁹⁰⁶ ⁹⁰⁷ ⁹⁰⁸ ⁹⁰⁹ ⁹¹⁰ ⁹¹¹ ⁹¹² ⁹¹³ ⁹¹⁴ ⁹¹⁵ ⁹¹⁶ ⁹¹⁷ ⁹¹⁸ ⁹¹⁹ ⁹²⁰ ⁹²¹ ⁹²² ⁹²³ ⁹²⁴ ⁹²⁵ ⁹²⁶ ⁹²⁷ ⁹²⁸ ⁹²⁹ ⁹³⁰ ⁹³¹ ⁹³² ⁹³³ ⁹³⁴ ⁹³⁵ ⁹³⁶ ⁹³⁷ ⁹³⁸ ⁹³⁹ ⁹⁴⁰ ⁹⁴¹ ⁹⁴² ⁹⁴³ ⁹⁴⁴ ⁹⁴⁵ ⁹⁴⁶ ⁹⁴⁷ ⁹⁴⁸ ⁹⁴⁹ ⁹⁵⁰ ⁹⁵¹ ⁹⁵² ⁹⁵³ ⁹⁵⁴ ⁹⁵⁵ ⁹⁵⁶ ⁹⁵⁷ ⁹⁵⁸ ⁹⁵⁹ ⁹⁶⁰ ⁹⁶¹ ⁹⁶² ⁹⁶³ ⁹⁶⁴ ⁹⁶⁵ ⁹⁶⁶ ⁹⁶⁷ ⁹⁶⁸ ⁹⁶⁹ ⁹⁷⁰ ⁹⁷¹ ⁹⁷² ⁹⁷³ ⁹⁷⁴ ⁹⁷⁵ ⁹⁷⁶ ⁹⁷⁷ ⁹⁷⁸ ⁹⁷⁹ ⁹⁸⁰ ⁹⁸¹ ⁹⁸² ⁹⁸³ ⁹⁸⁴ ⁹⁸⁵ ⁹⁸⁶ ⁹⁸⁷ ⁹⁸⁸ ⁹⁸⁹ ⁹⁹⁰ ⁹⁹¹ ⁹⁹² ⁹⁹³ ⁹⁹⁴ ⁹⁹⁵ ⁹⁹⁶ ⁹⁹⁷ ⁹⁹⁸ ⁹⁹⁹ ¹⁰⁰⁰

Properties: White to yellow crystals, with powerful odor of musk. Congealing point 111.7°C or 104-106°C. May have two congealing points. Soluble in benzyl benzoate, diethyl phthalate and dimethyl phthalate, fixed oils and volatile oils; sparingly soluble in methyl "Carbitol"; very slightly soluble in alcohol. Insoluble in water, glycerol, propylene glycol.

Use: Perfumery (fixative).

mustard gas. See dichlorodithyl sulfide.

mustard oil, artificial. See allyl isothiocyanate.

mustard oil, black. See mustard oil, volatile.

mustard oils. Organic compounds having the formula $R-N-C-S$, in which R is an alkyl or aryl radical, -NCS an isothiocyanate group. The name is derived from its best known member, allyl isothiocyanate (q.v.), which is the characteristic ingredient of mustard oil.

mustard oil, volatile (black mustard oil; sharp oil). Properties: Colorless to pale yellow limpid liquid slowly changing to reddish-brown on exposure to light. Pungent, acrid odor and taste. Soluble in alcohol. Sp. gr. 1.016-1.022 (rarely 1.030); refractive index 1.5254-1.52804; b.p. 148-154°C (760 mm).

Chief known constituents: Allyl isothiocyanate, carbon disulfide, allyl cyanide.

Derivation: From the seeds of *Sinapis nigra*, L., and *Sinapis juncea*, L. These are ground, rendered free of their fatty oil content by hydraulic pressure, mixed with warm water, allowed to ferment and then distilled.

Uses: Medicine; proprietary liniments.

"MV33." ⁴⁶⁷ Brand name for a vitreous refractory mullite; used in ceramics. Impervious to gas; compressive strength, 150,000 psi; max. service temperature 3200°F; hardness, Mohs scale 9. Fabricated by casting.

MVE. Abbreviation for methyl vinyl ether. See vinyl methyl ether.

m.w. Abbreviation for molecular weight.

"MX." ¹⁹⁹ Trademark for fiber-bonded abrasives.

Properties: High tensile strength and resistance to impact and heat shock; unusually resilient.

Uses: For finishing and polishing flutes of taps, drill and mills, reamers, etc.; removing burrs from milling and drilling operations; breaking edges of cast aluminum parts, etc.; cleaning cast iron molds; removing flash from molded plastics.

"My-B-Den." ²¹⁹ Trademark for the sodium salt of adenosine-5'-monophosphoric acid (see adenylic acid).

Use: Medicine.

"Myetfradin" Sulfate. ²²⁷ Trademark for neomycin sulfate.

"Mycobac." ²⁹⁹ Trademark for sodium and calcium propionates. These salts inhibit the growth of many fungi and of some microorganisms, particularly *Bacillus mesentericus*, for commercially significant periods of time. Because of this property they find application in many industries, particularly to inhibit mold and rots in bread, rolls (including "brown

and serve"), pie crust, etc. However, the presence of the calcium ion in some cases restricts the use of "Mycobac" calcium propionate.

"Mycosynth." ¹¹² Trademark for cysteine (q.v.).

"Mydof" 558. ¹²⁵ Trademark for a water-soluble acrylamide-type paper resin; used to improve the strength properties of chemical and groundwood pulps.

"Mytar." ²²⁵ Trademark for a polyester film. Seven available types used for electrical, industrial, and packaging uses.

Forms: Roll and sheet.

"Mytase." ¹¹⁹ A fungal amylase enzyme.

"Myleran." ⁴⁴¹ Trademark for busulfan.

myo-inositol. See inositol.

myokinase. An enzyme found in muscle and other tissues that catalyzes the reaction $2 \text{ ADP} \rightleftharpoons \text{ATP} + \text{AMP}$.

myrcene, essence of. See nitrobenzene.

myrcene (7-methyl-3-methylene-1,6-octadiene)

$\text{C}_{11}\text{H}_{18}$. A triply unsaturated aliphatic hydrocarbon found in oil of bay, verbena, hops, and others. Properties: Yellow, oily liquid; pleasant odor; b.p. 161°C (760 mm); sp. gr. of 81% myrcene 0.806 (15.5/15.5°C); refractive index of 81% myrcene 1.471 (20°C). Insoluble in water; soluble in alcohol, chloroform, ether, glacial acetic acid.

Uses: Preparation of perfume chemicals; GRAS flavoring.

"Myrcene 85." ⁸⁹⁴ Brand name for a special grade of the triply unsaturated aliphatic hydrocarbon, $\text{C}_{11}\text{H}_{18}$. 7-methyl-3-methylene-1,6-octadiene. Minimum purity 75%. Balance mainly β -limonene.

myrcia oil (bay oil; bayleaf oil).

Properties: Essential oil; yellow color, becoming brown on exposure to air; pleasant clove-like odor; pungent, spicy taste; phenol content 30-65%. Sp. gr. 0.950-0.990 (25/25°C), going as low as 0.919 for poor-quality oils; optical rotation 0 to -3°; refractive index 1.507-1.516 (20°C). Soluble in alcohol and glacial acetic acid.

Derivation: By distillation of the leaves of *Pimenta racemosa* (*Pimenta acris*). Note: Many of the species of the genera *Pimenta* and *Myrica* closely resemble one another. Thus, often, a mixture of the leaves is distilled unless great care is exercised in the gathering.

Uses: Flavor; perfume; bay rum.

myrica (candleberry; bayberry; wax myrtle; wax berry; tallow shrub). Bark of *Myrica cerifera* or *carolinensis*.

Habitat: Maryland to Florida, west to Texas and Arkansas.

Uses: Medicine; source of bayberry wax.

myrtil alcohol. See 1-triacontanol and 1-hentriacontanol. The term myrtil alcohol, which has been used for both by various authorities, should be dropped.

myrtil palmitate $\text{C}_{40}\text{H}_{82}\text{O}_2$ (approx). A wax ester found in beeswax.

myrtilic acid (tetradecanoic acid) $\text{C}_{14}\text{H}_{28}\text{O}_2$. Properties: Oily, white crystalline solid. Soluble in alcohol and ether; insoluble in water. Sp. gr. 0.8779 (30°C); b.p. 326.2°C (760 mm); 204.3°C (20 mm); m.p. 54.4°C; refractive index 1.4310 (in 60/D).

*See "Shipping Regulations," page xv.

Reference numbers refer to name of manufacturer. See "List of Manufacturers," page v.

isotope transportation tanks and fuel element transfer casks; in general as structural material applicable to radiation shielding.

Hazards: Has slight radioactivity; use must be discussed with Atomic Energy Commission.

"Nuocure 28."¹¹ Curing agent of 28% tin octoate for silicone resins, one-shot polyurethane foams, and rubber, offering a wide range of curing time.

"Nuodex 100 VT."¹² Trademark for quaternary ammonium naphthenate.
Use: Fungicide for vinyl formations.

"Nuogel AO."¹³ Trademark for aluminum octoate. Used in protective coatings and priming inks.

719 & 753. Aluminum soap. Used as gelling agent.

"Nuolates."¹⁴ Brand name for driers based on metallic salts of tall oil acids.

"Nuophene."¹⁵ Trademark for a technical grade of dihydrodichlorodiphenylmethane.
Use: Industrial fungicide.

"Nuoplas 1046."¹⁶ A non-phthalate ester used as plasticizer for stain-resistant vinyl compounds.

"Nuostab."¹⁷ Trademark for a series of vinyl stabilizers and fungicides. Many of them are metallic soaps or metal-organic complexes.

"Napercalin."¹⁸ Trademark for dibucaine.

"Napercalin."¹⁹ Hydrochloride.²⁰ Trademark for dibucaine hydrochloride.

"Nu-Pon."²¹ Trademark for epoxy resin primers and enamels for household appliances, metal products, and corrosion resistant applications.

"Nurox."²² Trademark for a polymerized wood resin.
Uses: Adhesives; glass oils; paper label coatings; oleuminous varnishes; solder flux; split varnishes; waxed paper and hot melt compounds; synthetic resins.

"Nust."²³ Trademark for proprietary satin finish nickel plating additive.

"Nuso."²⁴ Trademark for highly aromatic oils used as resin plasticizers.

Nusselt number. A number used in heat transfer studies and calculations to compare heat losses by conduction from various shaped objects under various conditions. It combines into a single number the actual heat loss (Q), the temperature difference (ΔT) between the body and its surroundings, the size (A) and shape of the body and the thermal conductivity (k) of the fluid surrounding the object, in the equation

$$Nu = Qd/\Delta T k.$$

nutgalls. See galls.

nutmeg oil (myristic oil).

Properties: Thin, colorless or pale-yellow liquid, volatile oil; strong nutmeg odor; warm, spicy taste; sp. gr. 0.850-0.910 for East Indian oil, 0.854-0.890 for West Indian oil; optical rotation $+8$ to $+30^\circ$ for East Indian oil, $+15$ to $+45^\circ$ for West Indian oil; refractive index 1.4740-1.4880 for East Indian oil, 1.4690-1.4760 for West Indian oil (both at 20°C); soluble in 90% alcohol, carbon disulfide and glacial acetic acid.

Chief known constituents: Myristin; phene; dipentene.

Derivation: By distillation from nutmeg, Myristica fragrans.

Grades: N.F. XII; F.C.C.; East Indian; West Indian.

Uses: Medicine; flavoring; perfumery.

"Neto."²⁵ Trademark for lubricating oils of good color and high resistance to oxidation; recommended for circulating and hydraulic systems.

"Nurabac."²⁶ Proprietary name for a hydrated compound consisting of sodium carbonate and sodium bicarbonate.

Uses: Dairy and food industry for neutralizing acidity in cream and related foods; dishwashing preparations; leather tanning; and textile processing.
nutrient solution. A water solution of minerals necessary for plant growth which is used instead of soil, the plants being supported by mechanical means. Such solutions contain various proportions of potassium, phosphorus, calcium, sulfur, and magnesium, together with traces of iron, boron, zinc, and copper. They are extensively used for commercial growing of flowers and vegetables, and also to some extent for house plants.
See hydroponics.

nut, vomica (poison nut; dog button; vomit nut). Dried ripe seed of Strychnos nux vomica. Odorless; pale brown to olive color.

Habitat: Southern Asia and Northern Australia.

Grade: Technical.

Uses: Medicine; source of alkaloids strychnine and brucine.

"Nu-Z."²⁷ Trademark for a fine cream-white powder assaying 32% zinc. Used as a foliar application to correct zinc deficiencies in plants, and in animal nutrition.

NW acid. Abbreviation for Neville and Winther's acid. See 1-naphthol-4-sulfonic acid.

"Nydrad."²⁸ Trademark for bondarid (q.v.).

"Nyefar."²⁹ Brand name for a liquid applied around oiled areas to retard oil spreading. A solvent evaporates leaving a polymer film across which lubricants do not spread or creep.

"Nyefret."³⁰ Brand name for a dolphin oil lubricant which reduces fretting corrosion for small springs and other instrument components. Viscosity 6 centistokes at 100°F .

"Nyefsehe."³¹ Brand name for a nonflammable, low-toxicity solvent for cleaning oils and oil-held soils from fine instruments.

"Nyfil."³² Trademark for glass fiber reinforced nylon.

nylidin hydrochloride

$\text{HOC}_6\text{H}_4\text{CH}(\text{OH})\text{CH}(\text{CH}_3)\text{NHCH}(\text{CH}_3)(\text{CH}_2)_5\text{C}_6\text{H}_5\cdot\text{HCl}$, para-hydroxy-alpha-[1-(1-ethyl-3-phenyl-propylamino)-ethyl] benzyl alcohol hydrochloride.

Properties: White, odorless, tasteless, crystalline powder; slightly soluble in water, alcohol; very slightly soluble in chloroform, ether; pH of 1% solution is between 4.5 and 6.5.

Grade: N.F. XII.

Use: Medicine.

nylon. This word is a generic term for any long-chain synthetic polyamide which has recurring amide groups—CONH—as an integral part of the main polymer chain. The term does not refer to a par-

*See "Shipping Regulations," page xv.

Reference numbers refer to name of manufacturer. See "List of Manufacturers," page v.

icular product but rather to a family of chemically related materials which may be fabricated and used in many different physical forms. See also polyamide resins.

A special numbering system identifies the chemical forms of nylon. The first number is the number of carbons in the diamine used, and the second number is the number of carbons in the dibasic acid used. See nylon 66. If the nylon is a monopolymer, the single number is again the number of carbon atoms in the monomer. These chemical forms are described in separate articles following this one, under nylon 4, nylon 66, etc. The physical forms are described as follows within this article.

nylon brushes. See nylon monofilaments.

nylon fiber. Generic name for a manufactured fiber in which the fiber-forming substance is any long-chain synthetic polyamide having recurring amide groups ($-CONH-$) as an integral part of the polymer chain (Federal Trade Commission).

nylon molding powders. Properties of a typical powder: In molded or extruded form, the natural color is translucent cream white. Colored material is available in some types. Outstanding characteristics are toughness over a wide range of temperatures; strength in thin sections; along with ability to be molded in thin sections; resilience; abrasion-resistance; good bearing characteristics; dimensional stability at temperatures as high as 275°F, and hence ability to be steam-sterilized; low specific gravity; generally good resistance to chemicals and solvents; good dielectric properties; self-extinguishing character.

Uses: Molding powder for collforms, sheathing of braided wire, electrical insulation, sterilizable utensils, brush-backs, combs, gear and bearings, slide fasteners, impact tools and machine parts.

nylon monofilaments. Nylon in the form of relatively coarse, flexible monofilaments. Commercial products include such items as fishing leaders, snells, and lines; level brushes for toothbrushes, hair-brushes, and industrial brushes; racket-strings; surgical sutures; and tapered paintbrush bristles.

Properties: Available in a range of properties depending upon the chemical type and auxiliary ingredients, as follows: tensile strength (73°F) 3000-9600 psi; elongation (73°F) 35-300%; modulus of elasticity (73°F) 38,000-285,000 psi; dielectric constant (60 cycles) 4.1-10.7, (10⁶ cycles) 3.4-4.5; power factor (60 cycles) 0.014-0.19, (10⁶ cycles) 0.03-0.14; mold shrinkage 0.010-0.015 in. per in.; compression ratio 2.1-2.5.

nylon plastic. Properties of a typical resin: Resistant to aqueous alkali solutions (hot or cold), to oxygen and to ozone. At temperatures below 25°C it is little affected, chemically, by nonoxidizing acids. Soluble in phenols and in lower aliphatic alcohols, particularly methanol and ethanol, with aid of heat. Insoluble in most other solvents, including aliphatic and aromatic hydrocarbons, halogenated hydrocarbons, ketones, esters, carbon disulfide, water.

Containers: Fiber drums; multiwall paper bags.

Uses: Adhesives for wood, textiles, metals, glass; hydrocarbon barrier in fuel cells; coatings for tex-

tiles and paper; protective coating for thread; finishes; stiffeners and binders for textiles.

nylon staple and tow. Crimped nylon fibers in a variety of lengths and deniers. Converted on standard textile equipment into 100% nylon spun yarns, or blended with natural or other synthetic fibers.

Containers: Bales or cartons.

Uses: In all branches of textile industry, as in yarns for sweaters and men's hosiery; woven sacking fabrics.

nylon yarn. Continuous single and multifilament types.

Containers: Bobbins, tubes, and beams.

nylon 4. A type of nylon made from pyroglutamic acid.

nylon 6. A nylon obtained by polycondensation of caprolactam.

Properties of fiber. Tensile strength (lbs/sq in) 73,000-120,000; elongation 16 to 42%; sp. gr. 1.14; moisture absorbency 8% at 95% relative humidity; m.p. 215°C. Soluble in some phenolic compounds, concentrated formic acid, and chloral hydrate.

Uses: Fiber and molding resin; used in tires, nonwoven fabrics.

nylon 66 (nylon 6,6; nylon 6/6). A nylon obtained by the condensation of hexamethylenediamine with adipic acid (polyhexamethylene adipamide). Properties: Sp. gr. 1.14; tensile strength (psi) 38,000-114,000; break elongation 16-42%; moisture regain 4.2% (70°F, 65% R. H.); m.p. 250°C; soluble in 90% formic acid, meta-cresol.

Containers: Bobbins, tubes, beams, bales, and cartons.

Uses: Fiber for apparel and home furnishings, tires, tarpaulins, etc.

nylon 610 (nylon 6, 10; nylon 6/10). A nylon obtained by the condensation of hexamethylenediamine with sebacic acid. Used for brush bristles and monofilaments.

nylon 7. A comparatively new nylon which is a polymer of ethyl aminohexanoate, a 7-carbon acid ester. It has a higher softening temperature (430°F) than the other nylons and is especially suitable for tire cords.

nylon 9. A type of nylon made from 9-aminononanoic acid.

nylon 11. A type of nylon made from 11-aminoundecanoic acid, and used commercially for fiber and molding purposes.

nylon cord for tires. Some representative commercial types are (1) 72% nylon 66, remainder a ring-structure nylon based on isophthalic acid; (2) 67% nylon 66, remainder a ring-structure nylon based on terephthalic acid; (3) co-melt of 70% nylon and polyester.

nylon, elastic. A modification of nylon 610 in which sebacic acid is copolymerized with hexamethylenediamine and a relatively small amount of an alkyl-substituted hexamethylenediamine.

"NyoGel." Brand name for a series of low shear thixotropic greases and semisolid lubricants for use where nonspreading properties are critical.

"NyoSil." Brand name for a wide temperature silicone instrument oil halogenated for improved wet properties. Viscosity 55 centistokes at 100°F.

*See "Shipping Regulations," page xv.
Reference numbers refer to name of manufacturer. See "List of Manufacturers," page v.